The Davison Freeway from M-10 to Oakland Avenue,
Hamilton Avenue Bridge Spanning Davison Freeway
Highland Park
Wayne County
Michigan

HAER No. MI-103-B

PHOTOGRAPHS

WRITTEN HISTORICAL AND DESCRIPTIVE DATA

Historic American Engineering Record
National Park Service
Great Lakes Systems Office
Department of the Interior
1709 Jackson Street
Omaha, Nebraska 68102-2571

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Historic American Engineering Record
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HAER No. MI-103-B

Location: Hamilton Avenue Spanning the Davison Freeway, Highland Park, Wayne County, Michigan

Quad: Highland Park, Michigan 1:24,000
UTM: 17.326770.4696140

Date of Construction: 1942

Engineers: Julian C. Meade, Engineer of Structural Design; and Harry A. Shuptrine, Engineer of Bridges and Structures, Wayne County Road Commission.

Builder: William J. Storen Company

Present Owner: Michigan Department of Transportation,
425 West Ottawa Street
Lansing, Michigan 48909

Present Use: Vehicular and pedestrian bridge, to be replaced by a new bridge.

Significance: This is one of three similar bridges designed to carry a major north-south arterial street over the Davison Limited Highway. The others were at Woodward and Oakland Avenues. The hinged, reinforced concrete, rigid-framed bridge design permitted maximum underclearance without raising the grade of the crossing street. Because this bridge also carried a Detroit Street Railway double-track streetcar line, along with automobile traffic, a two-span design was used, resulting in a stronger bridge than those at the other crossings over the Davison.

Historian: Charles K. Hyde, Wayne State University, Detroit, Michigan 48202, May 1996.

DESIGN AND CONSTRUCTION

This two-span hinged, reinforced concrete, rigid-framed bridge design was used because it permitted maximum underclearance without raising the grade of the streets crossing above. Each of the Hamilton Avenue bridge slabs are only 1 foot 3 inches thick at the crown, 3 feet 0.25 inches thick at the center pier, and 2 feet 8 inches at the abutments, and provides a minimum underclearance of 13 feet 2 inches next to the center pier. While the bridge was under construction, braces made up of railroad rails were built into the bottom segment of the abutments to prevent the abutments from overturning before the deck slab was poured. Once the deck slab was sufficiently solid, the braces were burned away.

In mid-March 1942, the Road Commission awarded a contract for three similar two-span bridges (at Hamilton, Woodward, and Oakland avenues) to the William J. Storen Company, in the amount of $329.957.20. The William J. Storen Company first appeared in the Detroit city directories as an independent contractor in 1939. Previously, Storen was listed as a vice president of the Cooke Contracting Company. For the Hamilton and Woodward bridges, Storen completely shut down vehicular traffic to speed construction, although the Detroit Street Railway lines remained in operation during construction.[1]

DESCRIPTION

This is in effect three parallel two span bridges, two for vehicular traffic and one for a double-tracked streetcar line. This particular bridge is not symmetrical because the western segments does not include a turning lane for the service drive. The western (vehicular)section of the bridge is 39 feet 11.50 inches wide, the central (streetcar) section is 17 feet 0.50 inches wide, and the eastern (vehicular with turning lane) is 57 feet wide, producing an overall width of 114 feet and an overall length of 87 feet. The slab carrying the streetcar line is 3 inches thicker than the rest of the bridge.

The reinforced concrete deck slabs, which carry vehicular traffic and support a 3.50 inch wearing surface, vary in thickness from 1 foot 3 inches at the crown, to 3 feet 0.25 inches at the center pier, and 2 feet 8 inches at the abutments. They rest on an open-type center pier, which is 3 feet thick, and a pair of reinforced concrete abutments with triangular cross-sections, one at each end, and these in turn rest on reinforced concrete footings. The abutments are 14 feet high, 2 feet 8 inches wide at the top, 1 foot 6 inches wide at the base, and extend the full width of the deck slab. The footings are 8 feet wide and range from 5 feet to 3 feet in height. The center pier also rests on a abutment 9 feet 6 inches wide under the roadway sections and 12 feet wide under the streetcar section. The bridge has two clears spans of 37 feet 2 inches. A median 6 feet wide is created by the center pier, which is 3 feet wide and two 6 inch raised curbs, each 1 foot 6 inches wide. Two 4-inch raised curbs near the abutments, each 2 feet 8 inches wide, reduces the clear width of the depressed roadway to a total of 66 feet, divided into two pavements of 33 feet.

Because the Davison Freeway dips slightly south as it passes under Hamilton Avenue, the bridge is slightly skewed, with the eastern spans slightly longer than the western spans. The over length of the eastern railing, for example, is 83 feet 4 inches, while the western railing is only 79 feet 2 inches long. Because the southwest corner of the bridge abuts Retaining Wall "A," there is no adjoining pylon or wing wall.

Each of the four corners of the bridge is defined by a large truncated pyramid or pylon of reinforced concrete extending from below the surface level of the depressed central roadway to approximately 5 feet above the road surface on the bridge proper. The slightly-curved pylons are then continued by longer, but thinner curved wing walls, also of reinforced concrete, which continue the bridge railing and establish the edge of the service road turning lane. The pylons and wing walls cover 78 degrees of a 90 degree turning radius.

The pylons are 21 feet 4 inches high, with a face measuring 8 feet long on the arc, and range in width from 2 feet 1 inches adjoining the railing post to 1 foot 6 inches at the edge of the wing wall. The wing walls range in height from 18 feet 10 inches at the edge of the pylons to 12 feet 8 inches at the ends. Each rests on footings with widths approximately half the height of the wall. Each wing wall measures 28 feet on the arc of the front face and is 1 foot 4 inches thick. The pylons and wing walls have decorative fluting (grooves) on their inside and outside facings. The grooves are 3 inches wide at the surface, 1.50 inches deep, and tapered to 2.50 inches wide at depth. Each pylon has three grooves, all 3 feet 6 inches long, while each wingwall has three grooves extending its entire height.

The bridge deck is divided into distinct segments. The railing on the west side of the bridge is anchored in an 8 inch high sidewalk 10 feet wide, while the railing on the east side is anchored in a 9 inch high raised curb which is 3 feet 4 inches wide. A single turning lane 15 feet wide adjoins the railing curb on the east side of the deck. The edge of the turning lane is defined by a raised island 8 inches high and 10 feet wide. This safety island keeps traffic in the turning lane separated from traffic on Hamilton Avenue and serves as sidewalks for pedestrians crossing the east side of the bridge. Since the relocation of the Davison north service drive in 1994, the turning lane has been blocked by large concrete barriers. The middle of the bridge is a 74-foot wide roadway, divided into five traffic lanes, including a turning lane for traffic making a left-hand turn to use the service drives.

The two bridge railings are identical and consist of symmetrical panels of welded square steel posts, rails, and spindles. Each railing is comprised of 9 panels, each 9 feet 8.25 inches long, for a total length of 87 feet 2.25 inches. The posts for each panel are 3 feet 2 inches tall and 7 inches square, with a 5 inch square cap. Each post has three parallel vertical ornamental fillets on the side facing the crossing street. Each fillet is 0.75 inch wide and 0.375 inch deep; the one in the center is 30 inches long, flanked by two shorter fillets, each 26 inches long. The end posts, which abut the concrete pylons, are 7 inches wide at the base, 12.50 inches wide at the top, and 9 inches thick.

The top and bottom rails each consist of two welded rectangular bars, one 2.25 inches wide and 1 inch high, which meets the 1 inch square horizontal posts in each panel and an outer bar 3 inches wide and 2.25 inches high. The bottom rail is 5.50 inches above the curb, while the top rail is 2 inches below the top of the post. Each panel includes 10 clusters of 3 spindles, each 1 inch square and 2 feet 0.50 inches long, with 2 inch spacing within each cluster, but 3.50 inch spacing between clusters. The pattern is continued without interruption through the length of the panel.

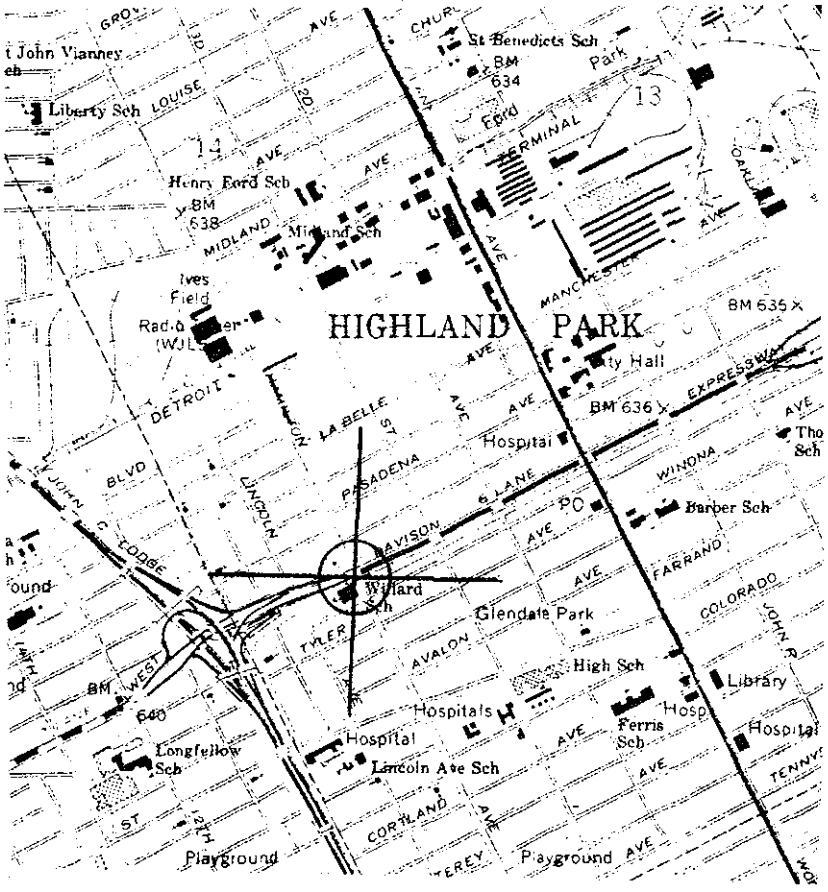
NOTES

[1]Polk's Detroit City Directory (Detroit: R.L. Polk & Company, 1928-1942); "New Plans Speed Work on Highway, County Proposal Wins Approval of Council," The Highland Parker, 8 January 1942; "Four Davison Highway Bridges 50 Per Cent Completed," Michigan Roads and Construction 39 (19 February 1942): 2; and "Open Brush, Third Bridges On Davison, Second Avenue Will Be Opened This Weekend," The Highland Parker, 9 April 1942. Contract details are found in the vertical files in the engineering offices of the Wayne County Department of Public Services.

THE DAVISON FREEWAY FROM M-10 TO OAKLAND AVENUE,
Hamilton Avenue Bridge Spanning Davison Freeway
HAER No. MI-103-B (page 7)

HIGHLAND PARK, MICHIGAN QUADRANGLE, 1:24,000

UTM: 17.326770.4696140



THE DAVISON FREEWAY FROM M-10 TO OAKLAND AVENUE,
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SITE PLAN